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STAMEN-NUMBERS IN CUPHEA

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WHILE studying a collection (*W. H. Duncan* 10659, 26 October, 1949, Clayton Co., Ga.) of several plants of *Cuphea* I observed considerable variation in the number of stamens, even on a single plant. Literature immediately available to me indicated that in our United States species there is disagreement as to the number of stamens and that no detailed studies had been made on this subject. My studies of plant-material and literature were then carried farther, including a trip¹ to the Gray Herbarium, Cambridge, Massachusetts.

Cuphea is a large American genus of over 200 species. Four species occur in eastern United States, at least one more (*C. wrightii* Gray) in southwestern United States, and many species in Mexico, Central America and South America. Three of those occurring in the United States [*C. procumbens* (Cav.) Small, *C. asper* Chapm., and *C. carthagenensis* (Jacq.) MacBride] are confined to the southeastern United States. Only one species, *C. petiolata* (L.) Koehne [*Parsonsia petiolata* (L.) Rusby, *Cuphea viscosissima* Jacq., *C. viscosissima* Willd. sensu Pursh 1816], has a wide distribution in the United States (Georgia to Louisiana, Kansas and New Hampshire).

Variation from a few to many stamens occurs in the *Lythraceae* of which *Cuphea* is a member. Stamen-numbers in *Cuphea* are mostly 11 but vary from 6 to 14. In our United States species the stamens are probably 11 except for some variation in *C.*

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petiolata. Various authors apparently disagree concerning the number in this species. Other authors do not mention the number of stamens. For example, Michaux (1803), Elliott (1821), and Robinson & Fernald (1908) give no stamen-numbers. Pursh (1816), under *C. viscosissima* Willd., says "floribus 12-andris". Torrey & Gray (1840) say "stamens 12" for this species, while Torrey (1843) gives no number but lists "Stamens about 12, unequal" for the genus. Britton (1901) indicates that there are sometimes 12 stamens in *C. petiolata*. Britton & Brown (1913) agree. Small (1933) actually uses "stamens 12" in keying out this species from the closely related *C. procumbens*, which he says has 11 stamens.

A thorough study of the genus was made by Koehne (1903). On page 85 in the Key to Sections, under Sect. 9. *Heterodon* Koehne, which includes *C. petiolata*, the stamens are listed as "11, alterne inaequalia". On the basis of a survey of the literature alone, therefore, it would appear that *C. petiolata* usually possesses 11 stamens but in some instances 12.

A brief analysis of herbarium material of *C. petiolata* yielded interesting results. Four flowers on one plant, from each of eight separate collections from seven states, were dissected and variation in size and number of stamens was recorded. The collections are from Washington Co., Tennessee; Rabun Co., Georgia; Franklin Co., Indiana; Davis Co., Iowa; Upshur and Cabell Cos., W. Va.; Allegheny Co., Pa., and Chain Bridge, Virginia. Although the stamens are uneven in size the differences are not pronounced and there are 11 stamens in each of the 32 flowers. These data certainly do not indicate that there are sometimes 12 stamens. The possibility that another species is involved was considered. This possibility is dismissed as being improbable, since all other characters agree well with those assigned to *C. petiolata* by several authors.

Four flowers from each of thirteen unmounted plants from the Clayton County, Georgia, collection were dissected and variation in size and number of stamens was recorded. The resulting data are given in TABLE 1. It may be seen that the number of stamens varies from 5 to 11, sometimes even on the same plant and that a pronounced reduction in size of some of the stamens is of frequent occurrence. Out of the 52 flowers dissected on the 13

plants 25 have 11, 10 have 10, 9 have 9, 3 have 8, 3 have 7, 1 has 6, and 1 has 5 stamens. Thus more than half of the flowers have 10 stamens or less. I shall not attempt to bring out the significance of this variation. It should, however, be emphasized that less reliance taxonomically should be placed on the number of stamens in *C. petiolata* than has been done by such authors as Pursh (1816), Torrey & Gray (1840), and Small (1933).

Plant No.	No. stamens	Notes on size of stamens
1	11-10-10-9	none
2	11-11-11-9	none
3	11-11-11-10	none
4	11-11-7-5	none
5	11-11a-10-9	(a) 3 much reduced
6	11-11-11b-9	(b) 3 much reduced
7	11-11-11-11c	(c) all 11 reduced equally
8	9-8-7-7	none
9	11-11-9-9	none
10	11-10-9d-6	(d) one, no anther; 2 fused
11	11-11-10-10	none
12	11-10-9e-8	(e) 6 much reduced
13	11f-10-10-8	(f) 2 reduced

TABLE 1. Numbers of stamens and notes on their sizes in four flowers on each of thirteen different plants in a collection of *Cuphea petiolata* from Clayton Co., Georgia.

Additional studies on stamen-numbers in *Cuphea* should be made. Although additional herbarium-material was available to me, dissections were not made because of the damage to the specimens that would have resulted from the dissection of a number of flowers on each plant. Persons collecting *Cuphea* might well keep this problem of stamen-numbers in mind and when possible collect adequate material for study. I would be happy to accept for study future United States collections that contain sufficient material for dissection-studies.

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A KEY TO THE HICKORIES NORTH OF VIRGINIA
 WITH NOTES ON THE TWO PIGNUTS,
 CARYA GLABRA AND C. OVALIS

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THERE are a number of good books which are useful in the identification of hickories, such as Gray's Manual, N. L. Britton and A. Brown (*Illustrated Flora of Northern States and Canada*), C. S. Sargent (*Manual of the Trees of North America*), A. Rehder (*Manual of Cultivated Trees and Shrubs*), J. S. Illick (*Pennsylvania Trees*), C. C. Deam (*Trees of Indiana*), C. C. Deam (*Flora of Indiana*), C. H. Otis (*Michigan Trees*), W. M. Harlow and E. S. Harrar (*Textbook of Dendrology*), W. M. Harlow (*Trees of Eastern U. S. and Canada*), A. F. Blakeslee and C. D. Jarvis (*Trees in Winter*), R. J. Preston Jr. (*North American Trees*) and others, many of them illustrated. The winter buds are best illustrated in Illick (the enlarged drawings), Blakeslee and Jarvis, Deam (*Trees of Indiana*), Harlow and Harrar, Harlow, and A. O. Huntington (*Studies of Trees in Winter*). The best characters for separating the hickories are the mature fruit, winter terminal buds, mature leaves, and bark of the trunk; these are represented only on fruiting older trees in the fall. With these features all present it is possible to name all of the hickories quite definitely. The books mentioned above rightfully base their separations on these features, with special emphasis on fruit. The best modern treatments or keys for *Carya*, with the latest names for the species, are in Sargent, Deam, Harlow and Harrar, Harlow, and Preston. The descriptions and illustrations of *C. glabra* and *C. microcarpa* in Otis both apply to *C. ovalis*, but the twigs should not be described as hairy. *C. ovalis* is not recognized by Illick. The names of 3 species of the region covered in this article have